COLOUR INDEX

THIRD EDITION

VOLUME
4

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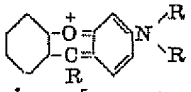
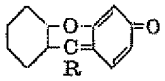
XANTHENE COLOURING MATTERS

The chromophore of the aminoxanthene dyes is the resonance-hybrid  where R = H, or alkyl, or aryl; the hydroxyxanthenes can be stabilised by the loss of a proton, forming an uncharged system in which the chromophore is the quinoid structure 

The dyes are prepared from xanthene derivatives with the usual auxochromes in *para*-position to the methane carbon atom. These derivatives are not obtained from xanthene itself, but by reacting together suitably chosen simple intermediates.

When R is an aryl radical, the dyes, although possessing the pyrone ring, have analogies with the triarylmethane class.

The xanthene class is subdivided into amino, aminohydroxy, and hydroxy derivatives.

In general, the xanthenes are basic dyes which possess remarkably pure bright hues, and their solutions are strongly fluorescent. They dye wool and silk directly from weak acid baths, and cotton on a tannin mordant. Some of the hydroxy compounds are valuable mordant dyes.

Special Literature

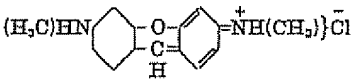
Hewitt, *Dyestuffs derived from Pyridine, Quinoline, Acridine, and Xanthene*, Longmans, Green & Co, London, 1922
Fierz-David, *Künstliche Organische Farbstoffe*, Julius Springer, Berlin, 1926
Elderfield, *Heterocyclic Compounds*, Vol. 2, p. 419, John Wiley & Sons, New York, 1951
Venkataraman, *The Chemistry of the Synthetic Dyes*, p. 740, Academic Press, New York, 1952
Lubs, *The Chemistry of Synthetic Dyes and Pigments*, p. 291, Reinhold Publishing Corporation, New York, 1955

XANTHENE COLOURING MATTERS

(I) — AMINO-DERIVATIVES (FLUORENE COLOURING MATTERS)

(*a*) PYRONINES

45000 **Basic Dye**



Oxidise C.I.45005 with potassium permanganate

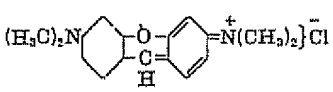
Discoverers — Bender and Kämmerer 1891

Acridine Red 3B

Leonhardt Co., *BP* 1231/92; *USP* 489625; *FP* 219023; *GP* 65282 (*Fr.* 3, 176)
Biehringer, *J. prakt. Chem.* 54 (1896), 235

Soluble in water (red with greenish yellow fluorescence)
Soluble in ethanol (red with greenish yellow fluorescence)
H_2SO_4 conc. — yellow with green fluorescence; on dilution — orange then red
Aqueous solution + NaOH — red ppt.

45005 **Basic Dye**



Condense *m*-dimethylaminophenol with formaldehyde, dehydrate the product with sulfuric acid and oxidise with ferric chloride

Discoverer — Bender 1889

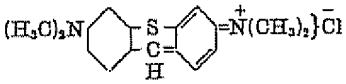
Pyronine G (By)

Bayer Co., *BP* 8673/89; *FP* 198785; *GP* 54190 (*Fr.* 2, 61)
Leonhardt Co., *BP* 13217/89, 18606/91; *USP* 445684; *FP* 200401; *GP* 58955, 59003, 63081, (*Fr.* 3, 92, 94, 93)
Gerber Co., *GP* 60505 (*Fr.* 3, 96)
BIOS 959, 10
Monit. sci. 4 [4] (1890), 751
Möhlan & Koch, *Ber.* 27 (1894), 2896
Biehringer, *Ber.* 27 (1894), 3299; *J. prakt. Chem.* 54 (1896), 217
Scott & French, *The Military Surgeon*, Nov. 1924

H_2SO_4 conc. — reddish yellow; on dilution — red
Aqueous solution + HCl — bright orange

Soluble in water (red with yellow fluorescence)
Soluble in ethanol (red with yellow fluorescence)

45006 **Basic Dye** (*Bluish red*)

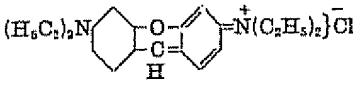


Heat *p,p'*-methylenebis[*N,N*-dimethylaniline] with flowers of sulfur in 25% oleum, and convert the sulfate to the chloride

Discoverer — Sandmeyer
Methylene Red (Gy)
Geigy, *GP* 65739 (*Fr.* 3, 97)
Kehrmann & Löwy, *Ber.* 45 (1912), 290

Soluble in water (blue red and brick red fluorescence)
H_2SO_4 conc. — orange; on dilution — blue red
Aqueous solution + NaOH — decolorised
Very similar in properties and usage to **C.I.45005**

45010 **Basic Dye**



Condense *m*-diethylaminophenol with formaldehyde and proceed as for **C.I.45005**

Discoverer — Bender 1889
Pyronine B (By)
Bayer Co., *BP* 8673/89; *FP* 198785; *GP* 54190 (*Fr.* 2, 61)
Leonhardt Co., *BP* 13217/89, 18606/91; *FP* 200401; *GP* 58955, 59003, 63081, (*Fr.* 3, 92, 94, 93)
Monit. sci. 4 [4] (1890), 751
Biehringer, *Ber.* 27 (1894), 3299; *J. prakt. Chem.* 54 (1896), 217
Scott & French, *The Military Surgeon*, November 1924

Solubilities, reactions, and uses similar to those of **C.I.45005**, except for a redder fluorescence and a bluer shade

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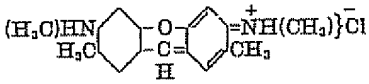
45015 **Basic Dye**



Condense 3-methylamino-*p*-cresol with formaldehyde in concentrated sulfuric acid and oxidise with ferric chloride

Discoverer — Nastvogel 1902
Rhodamine Scarlet G (By)
FDX 885 — Rhodamin Scharlach G
Patents as for **C.I. 45105**
Soluble in water and ethanol (orange red with strong yellow green fluorescence)
H_2SO_4 conc. — light citron yellow; on dilution — orange
Aqueous solution + NaOH — decolorised to faint pink

45020 **Basic Dye**

Probably a dye of the **Pyronine** type

Heat *m*-diethylaminophenol with chloral in glacial acetic acid containing disodium arsenate and crystalline sodium acetate for 4 hours at 100°C

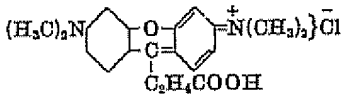
Discoverer — Ville 1901
Urbine E
Dyes tannin-mordanted cotton dull bluish red
Ville, *BP* 19721/01; *USP* 701427; *FP* 308968; *GP ap.* V4204 (*Fr.* 6, 283)
Cf. Badische Co., *BP* 15859/84; *USP* 625641; *FP* 240216; *GP* 81042 (*Fr.* 4, 177)

Soluble in water and ethanol (cherry red with yellowish orange fluorescence)
HCl conc. — blue violet

(*b*) SUCCINEÏNS

45050 **C.I. Basic Red 11** (*Pink*)

Zinc double chloride compound of



(*a*) Fuse *m*-dimethyl(or diethyl)aminophenol with succinic anhydride (*BP* 2635/89)

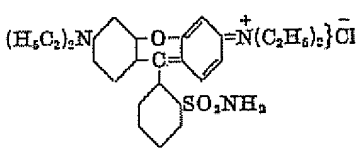
(*b*) React dimethylamine with resorcinol-succineïn at 170–200°C under pressure (*BP* 10047/90)

Discoverers — Kahn and Majert 1888
Ciba, *BP* 2635/89, 10047/90, 7298/92; *FP* 195930; *GP* 54997 (*Fr.* 2, 88), 66238, 71490, (*Fr.* 3, 177, 179)
Bayer Co., *FP* 194908; *GP* 51983 (*Fr.* 2, 86)
Gnehm, *USP* 402436, 425504
BIOS 959, 15
Färberztg. 26 (1890), 267
Dutt & Thorpe, *JCS*, 125 (1924), 2524

Soluble in water (red with yellow fluorescence)
Slightly soluble in ethanol (intense yellow fluorescence)
H_2SO_4 conc. — brownish yellow (strong green fluorescence); on dilution — rose red
Aqueous solution + NaOH — slowly decolorised

(*c*) SACCHAREÏNS

45070 **Basic Dye**



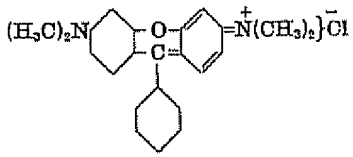
Condense *m*-diethylaminophenol with saccharin at about 165°C

Discoverer — Koetschet 1896
Saccharein (Mo)
Dyes tannin-aluminium mordanted cotton pink
Usines du Rhône, *BP* 21197/96; *FP* 267442; *GP* 100779 (*Fr.* 5, 233)
Monnet & Koetschet, *Bull. Soc. chim.* 17 (1897), 690, 1030

Soluble in water and ethanol (reddish violet)
Aqueous solution + HCl conc. — brown
Aqueous solution + NaOH — decolorised with ppt. of colour base

(*d*) ROSAMINES

45090 **Basic Dye**



Discoverers — Heumann and Rey 1889

Rosamine, Rosindamine or Benzorhodamine

Dyes tannin-mordanted cotton dull bluish red

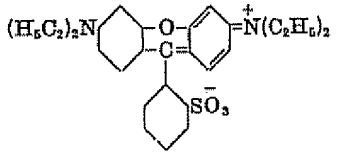
M.L.B., *FP* 200347; *GP* 51348 (*Fr.* 2, 64)
Bayer Co., *BP* 8673/89; *FP* 198785; *GP ap.* F 4097, 62574, (*Fr.* 2, 66, 98)
Badische Co., *GP* 69074 (*Fr.* 3, 169)

(*a*) Condense *m*-dimethylaminophenol with α,α,α-trichlorotoluene (benzotrichloride) — (Heumann and Rey)

(*b*) Condense benzaldehyde with *m*-dimethylaminophenol, dehydrate the product with sulfuric acid, and oxidise with ferric chloride — (*GP* 62574)

Soluble in water and ethanol (bluish red with bright yellowish red fluorescence)
H_2SO_4 conc. — orange yellow; on dilution — red
Aqueous solution + NaOH — bluer and less fluorescent

45095 **Acid Dye**



Discoverer — Koetschet 1896

Sulphurëin (Mo)

Dyes wool and silk from a neutral bath

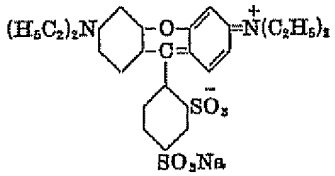
Usines du Rhône, *BP* 21196/96, 21197/96, 18017/97; *FP* 267442; *GP* 100779, 100780, (*Fr.* 5, 233, 235)
Geigy, *GP* 90487 (*Fr.* 4, 258)

(*a*) React **C.I.45070** with 70% sulfuric acid at 125–130°C — (*BP* 18017/97)

(*b*) Condense *o*-formylbenzenesulfonic acid with *m*-diethylaminophenol, dehydrate the product with sulfuric acid and oxidise with ferric chloride

Soluble in water and ethanol (bluish red with yellowish red fluorescence)
H_2SO_4 conc. — yellowish red; on dilution — bluish red

45100 **C.I. Acid Red 52** (*Bright bluish pink*)



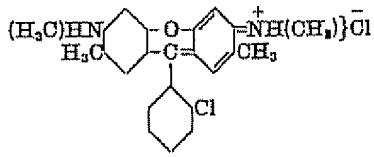
Discoverer — Emmerich 1906

M.L.B., *USP* 1003738; *GP* 205758 (*Fr.* 9, 216), 229466 (*Fr.* 10 244)
BIOS 959, 66
FIAT 764 — Sulforhodamin B

Condense 4-formyl-*m*-benzenedisulfonic acid with *m*-diethylaminophenol, dehydrate the product with sulfuric acid, oxidise with ferric chloride and convert to the sodium salt

Soluble in water and ethanol (bluish red with a yellow fluorescence)
H_2SO_4 conc. — orange yellow; on dilution — red
Aqueous solution + NaOH — bluish red

45105 **Basic Dye**



Discoverer — Nastvogel 1902

Rhodamine 5G (By)

Hue and dyeing properties similar to **C.I.45160**

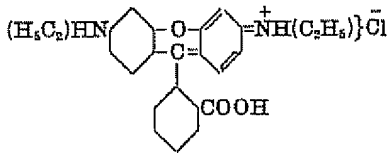
Bayer Co., *BP* 13192/03; *USP* 738227; *FP* 332926; *GP* 150440 (*Fr.* 7, 144)

Condense *o*-chlorobenzaldehyde with 3-methylamino-*p*-cresol sulfate, dehydrate the product with sulfuric acid, and oxidise with ferric chloride

Soluble in water and ethanol (red with a yellow fluorescence)
H_2SO_4 conc. — golden yellow; on dilution — orange red to pink ppt.
Aqueous solution + HCl — magenta with light yellow green fluorescence and ppt.

(*e*) RHODAMINES

45150 **C.I. Basic Red 8** (*Bright red → Bright bluish red*)
45150:1 **(C.I. Pigment Red 82)** is the phosphotungstomolybdic acid salt



Discoverer — Cérésole 1891

Badische Co., *BP* 14723/91; *USP* 516588, 516589; *FP* 215700; *GP* 63325 (*Fr.* 3, 175)

Heat equal weights of **C.I.45170** and aniline hydrochloride at 185–190°C for about 1½–2 hours

Soluble in water and ethanol (reddish violet with red fluorescence)
H_2SO_4 conc. — pale yellow; on dilution — red fluorescent solution
Aqueous solution + HCl — yellow

45155 Acid Dye

Sodium salt of a sulfonated Rhodamine, e.g. Rhodamine G (C.I.45150)

Note — It is uncertain whether the sulfonic acid group enters the phthalic acid radical or one of the other nuclei

Discoverers — Boedeker and C. Hoffmann 1898

Fast Acid Eosine G (MLB), Fast Acid Phloxine A (MLB)

Dyes wool in presence of sulfuric acid and silk in presence of acetic or sulfuric acid

Fastness Properties (C): Alkali 3–4, Alkaline Milling 2–3, Light 2–3, Perspiration 2–3, Sea Water 2–3, Washing 2–3, 2–3, 3

M.L.B., *BP* 2999/96; *USP* 642893; *FP* 253812; *GP* 87977 (*Fr.* 4, 248)
Chem. Ind. (1900), 9

Soluble in water (yellowish red with a strong green fluorescence)
H_2SO_4 conc. — yellow with a faint green fluorescence; on dilution — reddish yellow, then pink with a green fluorescence
Aqueous solution + NaOH — dark red with a strong dark green fluorescence

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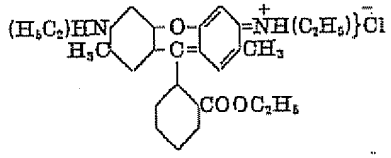
45160 C.I. Basic Red 1 (*Bright bluish pink*)

45160:1 (C.I. Pigment Red 81) is the phosphotungstomolybdic acid salt

45160:2 (C.I. Pigment Red 169) is a copper ferrocyanide complex

See also C.I. Solvent Red 36



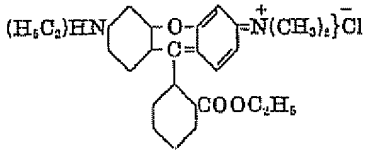
Condense 3-ethylamino-*p*-cresol with phthalic anhydride, and esterify the product with ethanol and a mineral acid

Note — The former use of *m*-ethylaminophenol has now been superseded as above

Discoverers — Bernthsen 1892; Schmid and Rey 1892
Badische Co., *BP* 9633/92; *USP* 516584; *FP* 225341; *GP* 73573, 73880, (*Fr.* 3, 183, 184)
BIOS 959, 12, 37
FIAT 764 — Rhodamin 6G
Bernthsen, *Chem. Ztg.* 16 (1892), 1956

Soluble in water (scarlet red with a greenish fluorescence)
Soluble in ethanol (red with a yellow fluorescence)
H_2SO_4 conc. — yellow; on dilution — red
Aqueous solution + NaOH — red ppt.

45165 Basic Dye



Condense *m*-dimethylaminophenol (1 mol.) with phthalic anhydride (1 mol.), then condense the product with *m*-ethylaminophenol and ethylate

Discoverer — Müller 1895

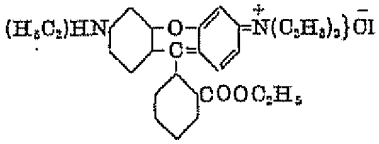
Rhodine 2G (SCI)

Dyes a brilliant red on tannin-mordanted cotton

Chem. Fabr. Bindschedler, Basle, *BP* 4985/95; *USP* 584119; *FP* 245593; *GP* 85931, 87068, *ap.* B16962, B17374, (*Fr.* 4, 260, 262, 262, 263)

Soluble in water (crimson red)
Soluble in ethanol (scarlet red with a green fluorescence)
H_2SO_4 conc. — yellow; on dilution — red
Aqueous solution + NaOH — scarlet red ppt.

45166 Basic Dye



Condense *m*-diethylaminophenol (1 mol.) with phthalic anhydride (1 mol.), then condense the product with *m*-ethylaminophenol and ethylate

Discoverer — Müller 1895

Rhodamine 4G (IG)

Brown & Mason, *JCS* (1933), 1264

Patents as for C.I.45165

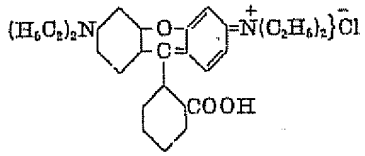
45170 C.I. Basic Violet 10 (*Bright reddish violet*)

45170:1 (C.I. Solvent Red 49) is the free base

45170:2 (C.I. Pigment Violet 1) is the phosphotungstomolybdic acid salt

45170:3 (C.I. Pigment Red 173) is the aluminium salt

Classical name **Rhodamine B**



(*a*) Condense *m*-diethylaminophenol with phthalic anhydride

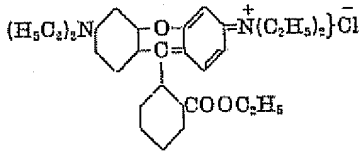
(*b*) React 3′,6′-dichlorofluoran with diethylamine under pressure — (*BP* 9600/88)

Note — The corresponding methyl derivative is not sufficiently soluble to be of value

Discoverers — Cérésole 1887; Homolka and Boedeker 1888
Badische Co., *BP* 15374/87; *USP* 377349, 377350; *FP* 186697, 198173; *GP* 44002 (*Fr.* 2, 68)
M.L.B., *BP* 9600/88; *FP* 192589; *GP* 54684 (*Fr.* 2, 86)
Brit. Dye Corp. & Hodgson, BP 205254
BIOS 959, 11, 32
FIAT 764 — Rhodamin B
Weingärtner, *Chem. Ztg.* 11 (1887), 1620
Knecht, *JSDC*, 4 (1888), 96; 21 (1905), 294
Bernthsen, *Chem. Ztg.* 16 (1892), 1956
Sansone, *Rev. gén. Mat. col.* 28 (1924), 127; 29 (1925), 132, 168; 30 (1926), 135, 168
Yamuda, *JSCI (Japan)*, 29 (1926), 591
Brown & Mason, *JCS* (1933), 1264

Soluble in water and ethanol (bluish red with strong fluorescence)
Slightly soluble in acetone
Very soluble in Cellosolve
H_2SO_4 conc. — yellowish brown with strong green fluorescence; on dilution — scarlet then to bluish red and orange
Aqueous solution + NaOH — rose red flocculent ppt. on heating

45175 **C.I. Basic Violet 11** (*Bright reddish violet*)
45175:1 **(C.I. Pigment Violet 2)** is the phosphotunstomolybdic acid salt



Esterification of **Rhodamine B (C.I.45170)** with ethyl chloride, or with ethanol and a mineral acid, or with ethanol at 160–170°C under pressure (*GP* 73451)

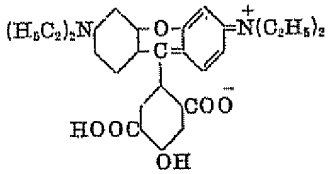
Discoverer — Monnet 1891
Monnet, *BP* 4677/92; *USP* 499927; *FP* 216407
Badische Co., *BP* 7298/92; *FP* 225341; *GP* 66238, 71490, 73451, (*Fr.* 3, 177, 179, 182)
BIOS 959, 11
FIAT 764 — Rhodamin 3B
Monnet, *Bull. Soc. chim.* 7 (1892), 523
Bernthsen, *Chem. Ztg.* 16 (1892), 1956; *Ber.* 26 (1893), 261; 27 (1894), 439

Fanal Red 6BM (IG)
Pigment for printing inks consisting of the copper ferrocyanide lake of C.I.45175

BIOS 961, 29; *BIOS* 1661, 19
FIAT 764 — Fanalrot 6BM

Soluble in water (violet red with brownish red fluorescence)
Soluble in ethanol (red with vermilion fluorescence)
H_2SO_4 conc. — greenish yellow; on dilution — red
Aqueous solution + HCl — yellow

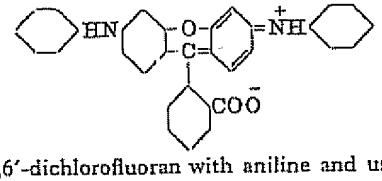
45180 **C.I. Mordant Red 27** (*Bluish pink*)



Condense 5-hydroxytrimellitic acid and *m*-diethylaminophenol with sulfuric acid in *o*-dichlorobenzene at 170–175°C
Note — The **Sodium Salt** is **Chromoxane Brilliant Red BD, 3BD extra**

Discoverers — Eckert and Schilling 1936
I.G., *BP* 472757; *USP* 2153059; *GP* 692708
BIOS 1433, 46, 48.
FIAT 1313, 2, 353
FIAT 764 — Chromoxanbrillantrot BL and BD

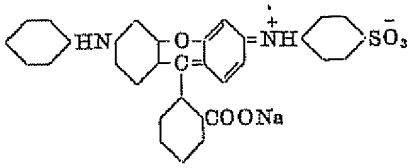
45185 **Solvent Dye** (*Bright violet*)



Condense 3′,6′-dichlorofluoran with aniline and use the product in the form of the free acid

Discoverer — I.G.
Spirit Fast Violet R (IG)
Solvent dye for use in alcoholic solvents for spirit lacquers and rubber stereo printing inks
Fastness Properties: Light, very good; Heat, stable to 130°C
BIOS 959, 14

45186 **C.I. Acid Violet 30** (*Violet*)

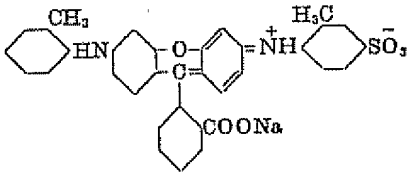


React aniline with 3′,6′-dichlorofluoran and sulfonate the product

Discoverers — Schmid 1888; Boedeker 1888
M.L.B., *BP* 9600/88; *FP* 195917, 201660; *GP* 49057 (*Fr.* 2, 79)
Badische Co., *GP* 46807 (*Fr.* 2, 75)
Durand & Huguenin, *BP* 251644
BIOS 959, 17

Soluble in water (reddish violet)
Slightly soluble in ethanol (reddish violet)
H_2SO_4 conc. — reddish orange; on dilution — violet with reddish violet ppt.
Aqueous solution + NaOH — cherry red

45190 **C.I. Acid Violet 9** (*Bright reddish violet*)
45190:1 **(C.I. Solvent Violet 10)** is the free base

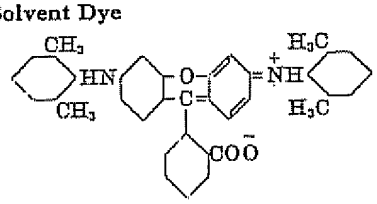


Condense *o*-toluidine with 3′,6′-dichlorofluoran, sulfonate the base **45190:1** obtained and convert to the sodium salt

Discoverer — Boedeker 1888
M.L.B., *BP* 9600/88; *FP* 195917, 201660; *GP* 44002, 45263, 46354, 46807, 47451, 49057, (*Fr.* 2, 68, 72, 74, 75, 75, 79)
Durand & Huguenin, *BP* 251644
BIOS 959, 5, 24
FIAT 764 — Echtsaeureviolett ARR
JSDC, 6 (1890), 80

Soluble in water (violet red)
Soluble in ethanol (violet)
Slightly soluble in acetone
Very soluble in Cellosolve
H_2SO_4 conc. — reddish orange; on dilution — red violet
HNO_3 conc. — magenta
HCl conc. — red violet
Aqueous solution + HCl — bluish ppt.

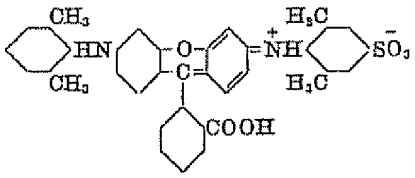
45195 **Solvent Dye**



Condense 3′,6′-dichlorofluoran with 2,6-xylidine

Discoverer — M.L.B. 1888
Violamine 3G Spirit Soluble (IG)
M.L.B., *GP* 48367, 49057, 53300, (*Fr.* 2, 79, 79, 81)
Bayer Co., *GP* 416618 (*Fr.* 15, 448), see also *Fr.* 15, 425
BIOS 959, 17

45196 Acid Dye



Sulfonate **Violamine 3G Spirit Soluble (IG) (C.I. 45195)**

Discoverer — M.L.B. 1889

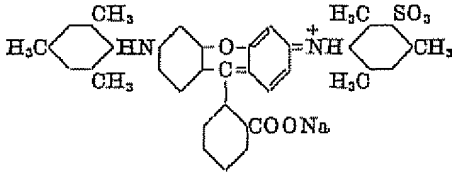
Fast Acid Pink B (MLB)

Dyes wool and silk in presence of sulfuric acid

Fastness Properties (C): Alkali 3–4, Light 5, Milling 2–3, Perspiration 2–3, Sea Water 2–3, Washing 3–4, 3, 3

References as for C.I.45195

45200 Acid Dye



Condense mesidine (2,4,6-trimethylaniline) with 3′,6′-dichlorofluoran, sulfonate the product and convert to the sodium salt

Discoverer — M.L.B. 1891

Violamine G (MLB). Acid Rosamine A (MLB)

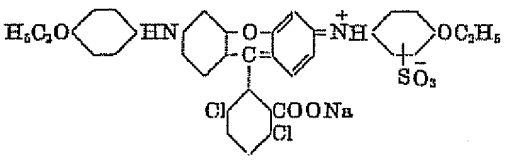
Dyes wool and silk in presence of sulfuric acid

Fastness Properties (C): Alkali 4, Light 2, Milling 2–3, Perspiration 3, Sea Water 3, Washing 2–3, 3

M.L.B., *FP* addn. to 201660; *GP* 67844 (*Fr.* 3, 174)
Bayer Co., *BP* 223596; *USP* 1543166

Soluble in water (yellowish pink)
Slightly soluble in ethanol
H_2SO_4 conc. — brownish yellow; on dilution — redder solution with red ppt.
Aqueous solution + HCl — red flocculent ppt.
Aqueous solution + NaOH — yellow ppt.

45205 C.I. Acid Blue 19 (*Reddish blue*)



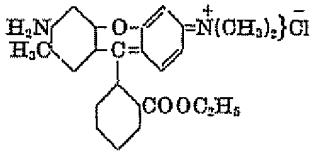
React *p*-phenetidine with 3′,4,6′,7-tetrachlorofluoran, sulfonate the product and convert to the sodium salt

Discoverer — Boedeker 1889

M.L.B., *BP* 9600/88; *FP* 192589, addn. to 201660; *GP* 48367, 49057, 53300, (*Fr.* 2, 79, 79, 81), 85805 (*Fr.* 4, 237)
JSDC, **9** (1893), 77
BIOS 959, 17

Soluble in water (dark blue)
Slightly soluble in ethanol (dark blue)
H_2SO_4 conc. — dark bordeaux red; on dilution — blue ppt.
Aqueous solution + NaOH — violet, which reddens on heating

45210 C.I. Basic Red 3 (*Bright bluish pink*)



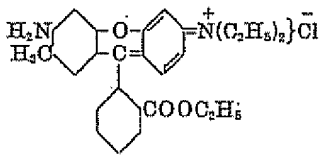
Condense *m*-dimethylaminophenol (1 mol.) with phthalic anhydride (1 mol.), then condense the product with 3-amino-*p*-cresol, and finally ethylate

Discoverer — Müller 1895

Chem. Fabr. Bindschedler, Basle, *BP* 4985/95, 12180/97; *USP* 584119, 695441; *FP* 245593, 317891; *GP* 85931, 87068, *ap.* B16962, B17374, (*Fr.* 4, 260, 262, 262, 263), 96108 (*Fr.* 5, 229), 132066 (*Fr.* 6, 282)
Schultz, *Farbstofftabellen*, 7th Ed., 868

Soluble in water (crimson red with a brown fluorescence)
Soluble in ethanol (scarlet red with a green fluorescence)
H_2SO_4 conc. — yellow; on dilution — red
Aqueous solution + NaOH — scarlet red ppt.

45215 C.I. Basic Red 4 (*Bright bluish pink*)



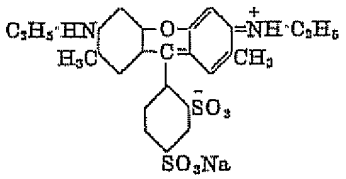
Prepare as for C.I.45210 with *m*-diethyl-, instead of *m*-dimethylaminophenol

Discoverer — Müller 1895

Patents as for **C.I.45210**
BIOS 959, 12
FIAT 764 — Rhodamin 3GO (also known as Irisamin O)
Brown & Mason, *JCS* (1933), 1264

Solubilities and reactions similar to those of C.I.45210

45220 C.I. Acid Red 50 (*Bright yellowish pink*)



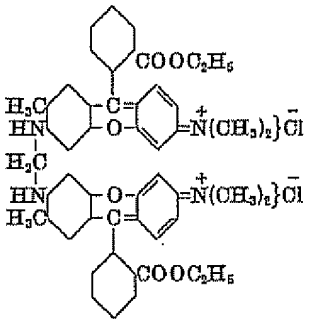
Condense 4-formyl-*m*-benzenedisulfonic acid with 3-amino-ethylamino-*p*-cresol, dehydrate the product with sulfuric acid, oxidise and convert to the sodium salt

Discoverer — Emmerich 1906

M.L.B., *USP* 1006738; *GP* 205758 (*Fr.* 9, 216, 229, 466; 10, 244)
FIAT 764 — Sulforhodamin G

Solubilities and reactions similar to those of C.I.45100

45225 **Basic Dye**



React formaldehyde with **Rhodamine 3G (C.I.45210)**

Discoverer — Brack 1899

Rhodine BS (SCI), Cotton Rhodine BS (SCI)

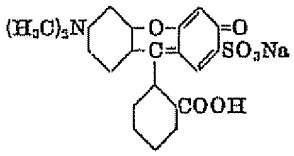
Dyes tannin-mordanted cotton bright violet red

Cassella Co., *USP* 643371; *GP* 109883 (*Fr.* 5, 232)

Soluble in water (bluish red)
H_2SO_4 conc. — yellowish brown; on dilution — reddish brown ppt.
Aqueous solution + NaOH — reddish brown ppt.

(II) — AMINO-HYDROXY-DERIVATIVES (RHODOLS)

45300 **C.I. Mordant Red 77** (*Bluish pink*)



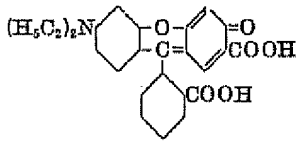
Condense *m*-dimethylaminophenol with phthalic anhydride and condense the product with 2,4-dihydroxybenzenesulfonic acid

Discoverers — de la Harpe and Bodmer 1911

Durand & Huguenin, *BP* 10523/11; *USP* 1002825, 1003257; *FP* 429302; *GP* 244652, 244653 (*Fr.* 10, 236, 239)

Soluble in water (cherry red with a strong yellow fluorescence)
H_2SO_4 conc. — lemon yellow with a green fluorescence; on dilution — orange red and then to pink
Aqueous solution + HCl — fluorescence disappears

45305 **C.I. Mordant Red 15** (*Bluish red*)

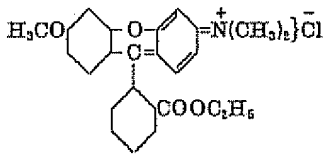


Condense *m*-diethylaminophenol (1 mol.) with phthalic anhydride (1 mol.), then condense the product with β-resorcylic acid and oxidise

Discoverer — I.G.

BIOS 959, 4
FIAT 764 — Chromogenrot B
Brown & Mason, *JCS* (1933), 1264

45310 **Basic Dye**



Condense *m*-dimethylaminophenol (1 mol.) with phthalic anhydride (1 mol.), then condense the product with *m*-methoxyphenol and ethylate

Discoverer — Brack 1900

Rhodamine 12GM (SCI), Rhodine 12GM (SCI)

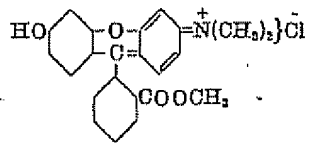
Dyes tannin-mordanted cotton yellowish red

Cassella Co., *GP* 108419 (*Fr.* 6, 230), 122289 (*Fr.* 6, 279)
cf. M.L.B., *BP* 15983/99; *USP* 656426; *FP* 291621 *GP* 116057, 119061 (*Fr.* 6, 271, 274)

Soluble in water and ethanol (yellowish red)
H_2SO_4 conc. — yellow; on dilution — yellowish red
Aqueous solution + NaOH — light red ppt.

45315 **Basic Dye**

Formaldehyde treated



Condense *m*-dimethylaminophenol with phthalic anhydride, condense the product with resorcinol, methylate, and treat with formaldehyde

Discoverer — Brack 1898

Rhodamine 12GF, 12G extra (SCI)

Dyes tannin-mordanted cotton a yellower red than **C.I.45310**

Chem. Fabr. Bindschedler, Basle, *BP* 18477/98; *USP* 613113, 625536; *FP* 280925; *GP* 106720 (*Fr.* 5, 231)

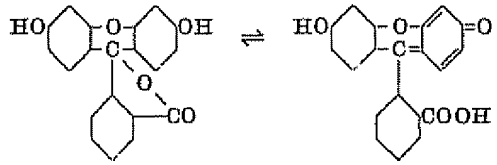
Soluble in water and ethanol (yellowish red)
H_2SO_4 conc. — yellow; on dilution — yellowish red
Aqueous solution + NaOH — light red ppt.

(III) — HYDROXY-DERIVATIVES (FLUORONE COLOURING MATTERS)

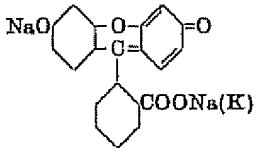
(*a*) HYDROXY-PHTHALEINS

45350 C.I. Acid Yellow 73
45350:1 (C.I. Solvent Yellow 94) is the free acid

Classical name **Fluoresceïn**



Classical name **Uranine**



Condense resorcinol with phthalic anhydride, alone or in presence of zinc chloride or sulfuric acid, for **Fluoresceïn**, and convert to sodium or potassium salt for **Uranine**

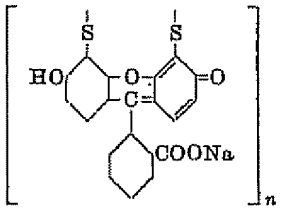
H_2SO_4 conc. — yellow with faint fluorescence; on dilution — yellow with yellow ppt.
Aqueous solution + NaOH — darker solution with a dark green fluorescence

Discoverer — Baeyer 1871
BIOS 959, 8, 15. *FIAT* 764 — Fluorescein
Baeyer, *Ber.* 4 (1871), 558, 662; 8 (1875), 146; *Ann.* 183 (1876), 2; 212 (1882), 347; 372 (1910), 107
E. Fischer, *Ber.* 7 (1874), 1211
Schreder, *Ber.* 11 (1878), 1342
Mühlhäuser, *Dingl.* 263 (1887), 49; 283 (1892), 182
Le Royer, *Ann.* 238 (1887), 360
R. Meyer & Oppelt, *Ber.* 21 (1888), 3376
R. Meyer, *Ber.* 24 (1891), 1412; 28 (1895), 428; *Z. phys. Chem.* 24 (1897), 468
R. Meyer & Hoffmeyer, *Ber.* 25 (1892), 1385, 2118
R. Meyer & Saul, *Ber.* 25 (1892), 3586
Bernthsen, *Chem. Ztg.* 16 (1892), 1956
O. Fischer & Hepp, *Ber.* 26 (1893), 2236; 27 (1894), 2790; 28 (1895), 396
Graebe, *Ber.* 28 (1895), 28
Nietzki & Schröter, *Ber.* 28 (1895), 44
Heller, *Ber.* 28 (1895), 312
Gattermann, *Ber.* 32 (1899), 1135
Hewitt, *Proc. CS*, 16 (1900), 3; *Z. phys. Chem.* 34 (1900), 5
Hewitt & Tervet, *JCS*, 81 (1902), 665
Kropp & Decker, *Ber.* 42 (1909), 578
Kehrmann & Dengler, *Ber.* 42 (1909), 870
Lombard, *Bull. Soc. chim.* 29 (4) (1921), 462
O. Fischer & Bollmann, *J. prakt. Chem.* 104 (1922), 123
Sansone, *Rev. gén. Mat. col.* 28, 127
Batscha, *Ber.* 59 (1926), 311
Orndorff & Hemmer, *JACS*, 49 (1927), 1272

Soluble in water and ethanol (yellow with intense green fluorescence)

45355 **Acid Dye**

Probably

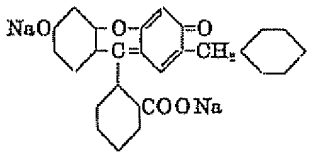


React **Fluoresceïn** (C.I.45350) with sodium sulfide
Note — The dithiol is the powerful mordant dye **Thiogallein**

Discoverer — Wyler 1894
Thiofluoresceïn (not the sulfur analogue of **C.I.45350** but *fluoresceïn disulfide*)
Gattermann, *Ber.* 32 (1899), 1127
Meyer & Szanecki, *Ber.* 33 (1900), 2577
Maki, *J. Coll. Eng. Tokyo*, 11 (1920), 1; cf. *JSDC*, 37 (1921), 119; *Rev. gén. Mat. col.* 25 (1921), 81

Almost insoluble in ethanol, ether, and benzene
More soluble in carbon disulfide

45360 **C.I. Acid Yellow 74**

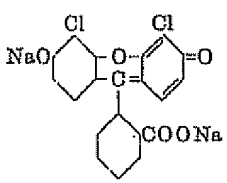


Condense resorcinol, phthalic anhydride, and α-chlorotoluene (benzyl chloride) in concentrated sulfuric acid

Discoverer — Reverdin 1877
Reverdin, *FP* 113695
Reverdin, *Monit. sci.* 7 [3] (1877), 860, 1104; *Z. Chem. Grossgew.* 2 (1877), 456, 668; 3 (1878), 625
Wilm, Bouchardat, & Girard, *Monit. sci.* 7 [3] (1877), 985

Soluble in water (brown with a green fluorescence)
H_2SO_4 conc. — yellow; on dilution — brown yellow ppt.

45365 **C.I. Solvent Orange 32**



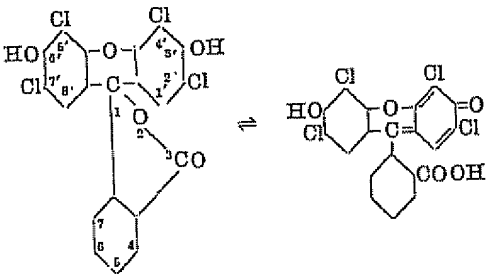
Condense 2-chlororesorcinol (1 mol.) with phthalic anhydride (1 mol.), then condense the product with 2-chlororesorcinol and convert to the sodium salt

Discoverers — Milligan and Hope 1945
Milligan & Hope, *JACS*, 67 (1945), 1507

Solubilities and reactions similar to those of C.I.45370

45366 C.I. Solvent Red 42 (*Bluish pink*)

Pectynin & Kuchina, *J. Gen. Chem.* (U.S.S.R.), 17 (1947), 278 (see *Chem. Abs.* 42 (1948), 534)

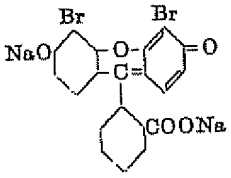


Condense 2,4-dichlororesorcinol (2 mol.) with phthalic anhydride (1 mol.), isolate the 2′,4′,5′,7′-tetrachlorofluorescein (m.p. 296–305°C) by extraction with sodium hydroxide, and acidify with hydrochloric acid

Insoluble in water
Soluble in aqueous 10% NaOH

45370 C.I. Acid Orange 11 (*Reddish orange*)
45370:1 (C.I. Solvent Red 72) is the free acid
45370:2 (C.I. Pigment Orange 39) is the aluminium salt

Discoverer — Badische Co.
BIOS 959, 6, 26
FIAT 764 — Eosin H 8G
Am. J. Pharm. (Sept. 1942), 342 (see also *Coal-tar Color Regulations*, U.S. Food and Drug Administration. Sept. 1940, 13)

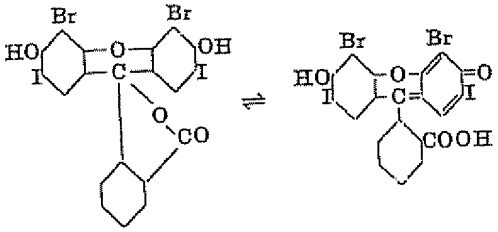


Dibrominate **Fluorescein** in aqueous sodium hydroxide and isolate as the sodium salt

Slightly soluble in water (orange with faint yellow fluorescence)
Soluble in ethanol (orange with a greenish yellow fluorescence)
Soluble in acetone (pink with a yellow fluorescence)
Very soluble in furfuryl and tetrahydrofurfuryl alcohol
H_2SO_4 conc. — red yellow; on dilution — yellow brown with orange ppt.
Aqueous solution + NaOH — eosine red
Glycerol and liquid paraffin — good dispersion

45371 C.I. Solvent Orange 18

Coal-tar Color Regulations, U.S. Food and Drug Administration, Sept. 1940, 16
Am. J. Pharm. (Sept. 1942), 341

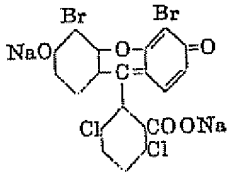


Prepare in an analogous manner to C.I.45366

Insoluble in water
Slightly soluble in ethanol
Soluble in aqueous 5% Na_2CO_3
H_2SO_4 conc. — yellow; on dilution — orange ppt.
10% aqueous NaOH — bright pink

45375 Acid Dye

Discoverer — I.G.
Phloxine N
BIOS 959, 10



Dibrominate 4,7-dichlorofluorescein with bromine, sodium chlorate, and ethanol as solvent

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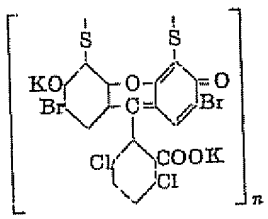
45376 Acid Dye

Discoverers — Société Gilliard, Monnet and Cartier 1889
Cyclamine (Mo), Thiophloxine (Mo)
Dyes wool from a neutral bath
Soc. Gilliard, Monnet & Cartier, *FP* 196363; *GP* 52139 (*Fr.* 2, 9)

Probably



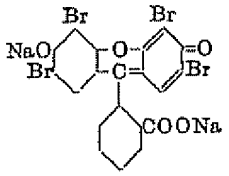
React 4,7-dichlorofluorescein with sodium sulfide, dibrominate the product, and convert to the potassium salt

Note — The methyl ester is **Thiocyanosine (Mo)** — (*GP* 52139)

Soluble in water (magenta red without fluorescence)
H_2SO_4 conc. — orange; on dilution — red flocculent ppt.
Aqueous solution + HCl — scarlet ppt.

45380 C.I. Acid Red 87 (*Yellowish pink*)
45380:1 (C.I. Pigment Red 90) is the lead salt
45380:2 (C.I. Solvent Red 43) is the free acid
45380:3 (C.I. Pigment Red 90:1) is the aluminium salt

Classical name **Eosine**

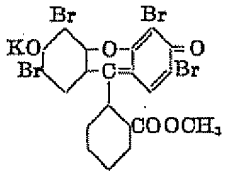


Brominate **Fluorescein** (C.I.45350) in aqueous or ethanolic solution to the tetrabromo derivative, and convert to the sodium salt

Discoverer — Caro 1871
Usines du Rhône, *GP* 108838 (*Fr.* 5, 215)
A. W. Hofmann, *Ber.* 8 (1875), 62
Baeyer, *Ber.* 8 (1875), 147; *Ann.* 183 (1876), 38
Bindschedler & Busch, *Mon. sci.* 20 (1878), 1170
Mühlhäuser, *Dingl.* 263 (1887), 49; 284 (1892), 21, 46
Bernthsen, *Chem. Ztg.* 16 (1892), 1956
Heller, *Ber.* 28 (1895), 312
R. Meyer, *Ber.* 28 (1895), 1576
R. Meyer & H. Meyer, *Ber.* 29 (1896), 2623
Knecht, *JSDC*, 21 (1905), 294
Scott & French, *The Military Surgeon*, November 1924
Delaplace, *Compt. rend*, 183 (1926), 69
Girard & Peyre, *Compt. rend.* 183 (1926), 84
BIOS 959, 6
FIAT 764 — Eosin G

Soluble in water and ethanol (bluish red with a yellowish green fluorescence)
H_2SO_4 conc. — yellow; on dilution — yellowish red ppt.

45385 C.I. Solvent Red 44 (*Bright bluish red*)



Methylate **Eosine** (C.I.45380) and convert to the potassium salt

Discoverer — Caro 1874
Baeyer, *Ann.* 183 (1876), 53
Bindschedler & Busch, *Mon. sci.* 20 (1878), 1172
Herzig, *Mhft. Chem.* 13 (1892), 422
Bernthsen, *Chem. Ztg.* 16 (1892), 1956
Nietzki & Schröter, *Ber.* 28 (1895), 44

Soluble in hot water (cherry red)
Soluble in aqueous ethanol (red with a brownish yellow fluorescence)
H_2SO_4 conc. — yellow; on dilution — brownish yellow ppt.
Aqueous solution + NaOH — darker solution with a green fluorescence

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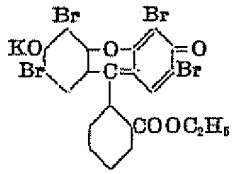
45386 C.I. Solvent Red 45 (*Bright bluish red*)

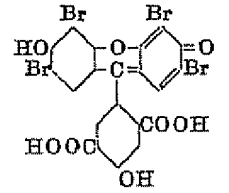


Ethylate **Eosine** (C.I.45380) and convert to the potassium salt

Discoverer — Caro 1874
Baeyer, *Ann.* 183 (1876), 46
Bindschedler & Busch, *Chem. News*, 38 (1878), 226
Mühlhäuser, *Dingl.* 263 (1887), 49, 100; 283 (1892), 210
Bernthsen, *Chem. Ztg.* 16 (1892), 1957
Nietzki & Schröter, *Ber.* 28 (1895), 46
BIOS 959, 7

Slightly soluble in hot water (cherry red with a faint greenish-yellow fluorescence)
Slightly soluble in ethanol (red and a brownish yellow fluorescence)
H_2SO_4 conc. — yellow; on dilution — brownish yellow ppt.

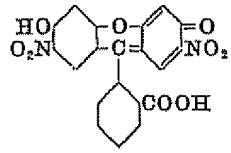
45390 Mordant Dye



Condense 5-hydroxytrimellitic acid with resorcinol and tetrabrominate

Discoverer — I.G.
Chromoxane Brilliant Red RD (IG)
FIAT 1313, 2, 354

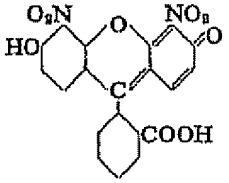
45395 Solvent Dye (*Yellowish orange*)



Nitrate **Fluorescein** with concentrated sulfuric acid (66°Bé) and 98% nitric acid at 0°C

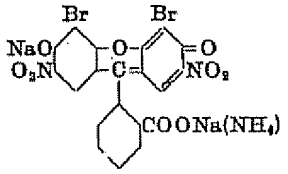
Discoverer — I.G.
Orange for Lipsticks (IG)
BIOS 959, 10
FIAT 764 — Orange fuer Lippenstifte

45396 C.I. Solvent Orange 16 (*Yellowish orange*)



Hewitt & Woodford, *JCS* 77 (1900) 1326, 81 (1902) 893
Proc. Chem. Soc. 18 (1902) 128

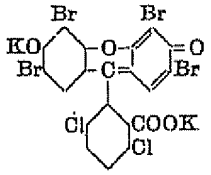
45400 **C.I. Acid Red 91** (*Bright bluish red*)



Nitrate 4′,5′-**Dibromofluorescein** (**C.I.45370**) and convert to the sodium or ammonium salt

Discoverers — Caro 1875; Baeyer 1876
Baeyer, *Ann.* **183** (1876), 61; 202 (1880), 68
Witt, *Chem. Ind.* **9** (1886), 4
Mühlhäuser, *Dingl.* **263** (1887), 49, 103; **284** (1892), 93
Matras, *Chem. Ztg.* **19** (1895), 408
Hewitt & Woodforde, *JCS*, **81** (1902), 893
BIOS 959, 6
FIAT 764 — Eosin BMX

45405 **C.I. Acid Red 98** (*Bluish red*)
Classical name **Phloxine**

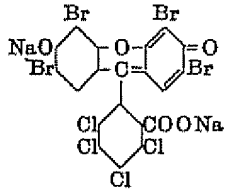


Tetrabrominate the 4,7-dichlorofluorescein obtained by condensation of resorcinol with 3,6-dichlorophthalic anhydride, and convert to the potassium salt

Discoverer — Noelting 1875
Casthelaz, *BP* 447/79
Chem. Ind. **3** (1880), 59
Le Royer, *Ann.* **238** (1887), 358
Graebe, *Ber.* **33** (1900), 2019
Graebe & Gourevitz, *Ber.* **33** (1900), 2023
BIOS 959, 10

Soluble in water (cherry red with a greenish yellow fluorescence)
H_2SO_4 conc. — brownish yellow unaltered by heating; on dilution — brownish yellow ppt.
Aqueous solution + NaOH — bluish red solution

45410 **C.I. Acid Red 92** (*Bright pink*)
45410:1 (**C.I. Solvent Red 48**) is the free acid
45410:2 (**C.I. Pigment Red 174**) is the aluminium salt
Classical name **Phloxine B**

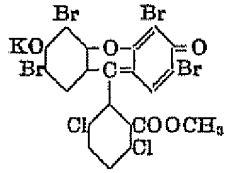


Tetrabrominate the 4,5,6,7-tetrachlorofluorescein obtained by condensation of resorcinol with tetrachlorophthalic anhydride, and convert to the sodium salt

Discoverer — Gnehm 1882
Ciba, *USP* 322368; *GP* 32564 (*Fr.* 1, 318), 50177 (*Fr.* 2, 93)
Graebe, *Ann.* 238 (1887), 333

Soluble in water (bluish red and a faint dark green fluorescence)
Soluble in ethanol (bluish red with a brick red fluorescence)
H_2SO_4 conc. — yellow; on dilution — yellowish red ppt.

45415 **Solvent Dye**

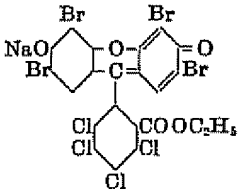


Methylate **Phloxine** (**C.I.45405**)

Discoverer — Noelting 1876
Cyanosine (Spirit Soluble) (**MLB**)
FDX 885 — Cyanosin

Insoluble in water
Soluble in ethanol (bluish red with a reddish yellow fluorescence)
H_2SO_4 conc. — yellow; on dilution — reddish brown ppt.
Aqueous solution + HCl — fluorescence disappears

45420 **Acid Dye** (*Yellowish red*)

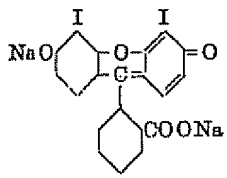


Ethylate **Phloxine B** (**C.I.45410**)

Discoverer — Gnehm 1882
Cyanosine B
Dyes wool bluish red from a weak acid dyebath and is used for spirit varnishes

Slightly soluble in water (red with a yellow fluorescence)
H_2SO_4 conc. — yellowish brown; on dilution — brownish red ppt.

45425 **C.I. Acid Red 95** (*Yellowish red*)
45425:1 (**C.I. Solvent Red 73**) is the free acid
45425:2 (**C.I. Pigment Red 191**) is the aluminium salt



Diiodinate **Fluorescein** (**C.I.45350**) in aqueous solution with iodine and iodic acid or with iodine chloride and alkali

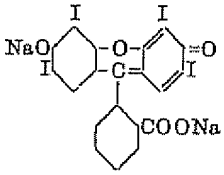
Note — **Erythrosine 6G** is a mixture of the sodium salts of monoiodo- and a little diiodofluorescein (*BIOS* 959, 7)

Discoverer — Noelting 1875
BIOS 959, 7
FIAT 764 — Erythrosin 6G

Soluble in water (cherry red without fluorescence)
H_2SO_4 conc. — brownish yellow; on dilution — brownish yellow ppt.
Aqueous solution + NaOH — soluble red ppt.

45430 C.I. Acid Red 51 (*Bluish pink*)
C.I. Food Red 14
45430:1 (C.I. Pigment Red 172) is the aluminium salt
45430:2 (C.I. Solvent Red 140) is the free acid

Classical name **Erythrosine**

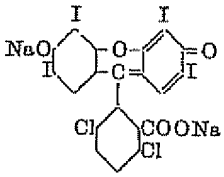


Tetraiodinate **Fluoresceïn** (C.I.45350) in aqueous or ethanolic solution and convert to the sodium salt

Discoverer — Kussmaul 1876
Usines du Rhône, *GP* 108838 (*Fr.* 5, 215)
Bindschedler & Busch, *Mon. sci.* 20 (1878), 1171
Mühlhäuser, *Dingl.* 263 (1887), 106; 283 (1892), 234, 258
Leys, *Ann. Chim. anal.* 21 (1916), 25
Gomberg & Tabern, *Ind. Eng. Chem.* 14 (1922), 1113
Kober, *Ind. Eng. Chem.* 15 (1923), 837
Wales & Nelson, *JACS*, 45 (1923), 1663
BIOS 959, 7. *BIOS* 1433, 75
FIAT 764 — Erythrosin J

Soluble in water (cherry red without fluorescence)
H_2SO_4 conc — brownish yellow; on dilution — brownish yellow ppt.
Aqueous solution + NaOH — soluble red ppt.

45435 C.I. Acid Red 93 (*Bluish red*)
45435:1 (C.I. Solvent Red 47) is the free acid

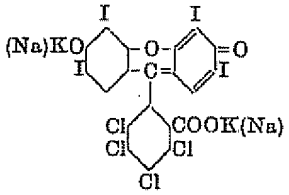


Tetraiodinate 4,7-dichlorofluorescein with iodine in presence of potassium or sodium chlorate and cupric chloride

Discoverer — Noelting 1875
Le Royer, *Ann.* 238 (1887), 359
Leys, *Ann. Chim. anal.* 21 (1916), 25; cf. *JSDC*, 32 (1916), 121
Coal-tar Color Regulations, U.S. Food and Drug Administration, Sept. 1940, 22
BIOS 959, 3
FIAT 764 — Bengalrosa GTO

Soluble in water (cherry red with no fluorescence)
H_2SO_4 conc. — brownish yellow; on dilution — brownish red ppt.
Aqueous solution + NaOH — crimson red soluble ppt.

45440 C.I. Acid Red 94 (*Bright bluish pink*)
45440:1 (C.I. Solvent Red 141) is the free acid

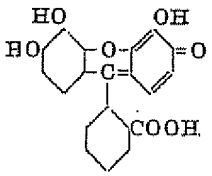


Tetraiodinate 4,5,6,7-tetrachlorofluoresceïn obtained by condensation of resorcinol with tetrachlorophthalic anhydride, and convert to the potassium salt

Discoverer — Gnehm 1882
Ciba, *USP* 322368; *GP* 32564 (*Fr.* 1, 318), 50177 (*Fr.* 2, 93)
BIOS 959, 13

Soluble in water (bluish red without fluorescence)
H_2SO_4 conc. — brown; on dilution — flesh pink ppt.

45445 C.I. Mordant Violet 25 (*Bluish violet*)



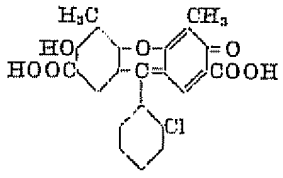
Heat gallic acid (or pyrogallol) with phthalic anhydride at 190–200°C or **Gallein**, and convert to the sodium salt for **Alizarine Violet**

Discoverers — Baeyer (from pyrogallol) 1871
Gürke (from gallic acid) 1884
Gürke, *GP* 30648, 32830, (*Fr.* 1, 319, 320)
FIAT 764 — Gallein
Baeyer, *Ber.* 4 (1871), 457, 555, 663
Durand, *Bull. Soc. ind. Mulhouse*, 48 (1878), 326; *Monit. sci.* 8 [3] (1878), 1122
Montlaur, *Monit. sci.* 10 [3] (1880), 1338
Buchka, *Ann.* 209 (1881), 249; *Ber.* 14 (1881), 1326
Herzig, *Mhft. Chem.* 13 (1892), 425
Orndorff & Brewer, *Am. Chem. J.* 23 (1900), 425; 26 (1901), 97
Knecht, *JCS*, 125 (1924), 1537

H_2SO_4 conc. — reddish yellow; on dilution — flocculent reddish yellow ppt.
Aqueous solution + NaOH — blue

Free acid —
Soluble in hot water (scarlet red)
Soluble in hot ethanol (reddish brown)

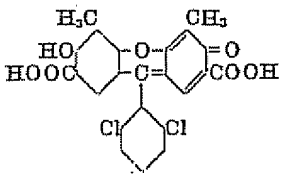
45450 Mordant Dye



Condense 3-methyl-β-resorcylic acid with *o*-chlorobenzaldehyde in concentrated sulfuric acid, and oxidise with nitrosyl sulfuric acid

Discoverer — Weiler 1923
Chromoxane Red B (By)
Bayer Co., *BP* 247003; *USP* 1532790; *FP* 593774; *GP* 423093, 430832, (*Fr.* 15, 449, 450)

45455 **Mordant Dye**



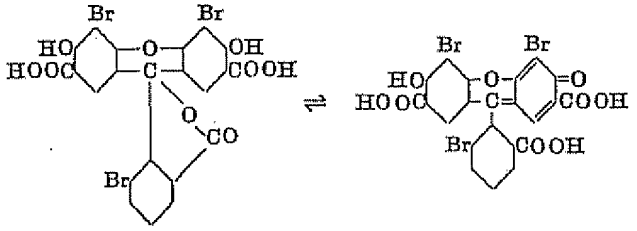
Condense 3-methyl-β-resorcylic acid with 2,6-dichlorobenzaldehyde in concentrated sulfuric acid, and oxidise with nitrosyl sulfuric acid

Discoverer — Weiler 1923

Chromoxane Red Violet 1358 (By)

Bayer Co., *BP* 247003; *USP* 1532790; *FP* 593774; *GP* 423093, 430832, (*Fr.* 15, 449, 450)

45456 **C.I. Solvent Orange 17**



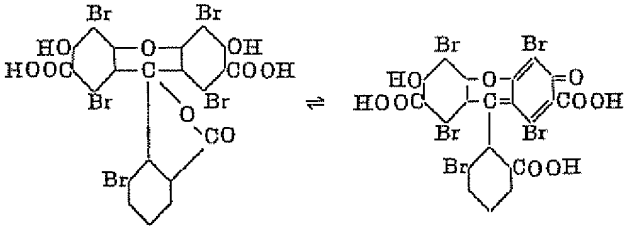
Coal-tar Color Regulations, U.S. Food and Drug Administration, Sept. 1940, 15

Am. J. Pharm., (Sept. 1942), 343

Insoluble in water

Soluble in aqueous 5% Na_2CO_3

45457 **C.I. Solvent Red 46** (*Bluish pink*)



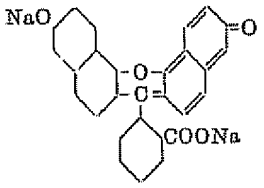
Coal-tar Color Regulations, U.S. Food and Drug Administration, Sept. 1940, 22

Am. J. Pharm. (Sept. 1942), 345

Insoluble in water

Slightly soluble in aqueous 5% Na_2CO_3

45460 **Acid Dye**



Condense 1,6-naphthalenediol (2 mol.) with phthalic anhydride (1 mol.) and convert to the sodium salt

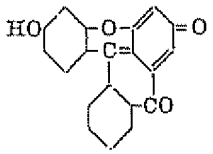
Discoverer — I.G.

BIOS 959, 14. *BIOS* 1433, 65

FIAT 764 — Scheckfarbstoff AS

(*b*) ANTHRAHYDROXY-PHTHALEÏNS

45500 **Mordant Dye**



Heat **Fluoresceïn (C.I.45350)** with a large proportion of concentrated sulfuric acid

Discoverer — Baeyer 1876

Coerulein B (MLB)

An afterchrome green of poor fastness properties

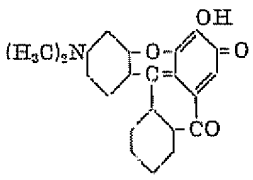
cf. M.L.B., *BP* 7170/95; *FP* 246472; *GP* 86225 (*Fr.* 4, 225), 97640, 98075, (*Fr.* 5, 217, 217)

Baeyer, *Ann.* 183 (1876), 28

Soluble in water (red)

Aqueous solution + NaOH — greenish blue

45505 **Mordant Dye**



Condense *m*-dimethylaminophenol with phthalic anhydride, then condense the product with pyrogallol, and dehydrate by heating with 96% sulfuric acid at 155–160°C

Discoverer — Sandoz 1911

Ultraviridine B (S)

Dyes chromed cotton and wool dark green, fast to light

Sandoz, *GP* 257084 (*Fr.* 11, 717)

Cassella Co., *BP* 14220/00; *FP* 302725; *GP* 122352 (*Fr.* 6, 280)

cf. Bayer Co., *BP* 22818/07; *FP* 302725, 382920, 443377; *GP* 196752 (*Fr.* 9, 839)

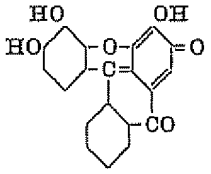
Soluble in water and ethanol (blue)

H_2SO_4 conc. — dark brown; on dilution — olive and then blue

Aqueous solution + NaOH — dark green ppt.

45510 C.I. Mordant Green 22 (*Dull green*)

Bisulfite compound of



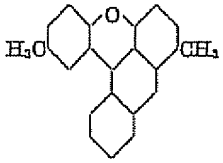
Heat Gallein (C.I.45445) with concentrated sulfuric acid to about 200°C, and convert the insoluble coerulein into the water-soluble bisulfite compound

Discoverers — Baeyer 1871; Prud'homme (bisulfite compound) 1879
Badische Co., *BP* 3850/81 (provisional only)
M.L.B., *GP* 252576 (*Fr.* 11, 719)
I.G., *BP* 251968: *USP* 1656483; *FP* 614202; *Sw P* 119722; *GP* 445847 (*Fr.* 15, 451)
FIAT 764 — Coerulein S
Baeyer, *Ber.* 4 (1871), 556, 663
Koechlin, *Bull. Soc. ind. Mulhouse*, 46 (1876), 550
Prud'homme, *Bull. Soc. ind. Mulhouse*, 46 (1876), 1879
Durand, *Bull. Soc. ind. Mulhouse*, 48 (1878), 326; *Mon. sci.* 8 (1878), 1122
Buchka, *Ann.* 209 (1881), 272
JSDC, 1 (1885), 297
Knecht, *JSDC*, 2 (1886), 112
Orndorff & Brewer, *Am. Chem. J.* 23 (1900), 425; 26 (1901), 97

Slightly soluble in water (dull greenish brown)
Soluble in hot ethanol (greyish blue)
H_2SO_4 conc. — dark brown; on dilution — greenish black

(IV) — MISCELLANEOUS DERIVATIVES

45550 C.I. Solvent Green 4 (*Dull olive*)*
C.I. Fluorescent Brightener 74

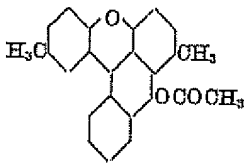


Condense *p*-cresol (2 mol.) with phthalic anhydride (1 mol.) to 2′,7′-dimethylfluoran, cyclise this in oleum (24%), reduce the product with zinc dust and ammonia under pressure to the dye, and purify by sublimation at 250–280°C/1–2 mm.

* Mineral oil

Discoverer — Badische Co.
BIOS 987, 185, 186
BIOS 1433, 107
FIAT 1313, 2, 61
FDX 885 — Fluorol 5G

45555 C.I. Fluorescent Brightener 155



Condense *p*-cresol (2-mol.) with phthalic anhydride (1 mol.) to 2′,7′-dimethylfluoran, cyclise this in oleum (24%), reduce with zinc dust and caustic soda in presence of pyridine and acetylate with acetic anhydride to give 2,8-dimethyl-9-ceroxenol acetate.

Discoverer T. A. Cassidy 1938
Wilmot and Cassidy Inc., *USP* 2127107
Ferrario, *Ann.* 348 (1906) 226
Venkataraman, *The Chemistry of Synthetic Dyes*, 1952, 747